Amendments to the Claims:

This listing of claims replaces all prior versions and listings of claims in the application:

Listing of Claims:

1. (Previously presented) A method for positioning a mobile station, comprising:

a. instructing a serving base station to measure Round Trip Time (RTT) between the serving base station and the mobile station, when a positioning request from the mobile station is received in a mobile communication network, receiving a measurement result reported from the serving base station, and at the same time sending a measurement control message to the mobile station;

b. determining all repeaters that take the serving base station as a donating base station, configuring auxiliary positioning parameters for the repeaters, and controlling transmission of auxiliary positioning signals from the repeaters to the mobile station;

c. measuring, in the mobile station, Time Differences of Arrival (TDOAs) between the base stations and the repeaters according to the measurement control message sent from the mobile communication network and the auxiliary positioning signals sent from the repeaters, and reporting TDOA measurement results to the mobile communication network; and

d. determining a position of the mobile station by estimating, in the mobile communication network, the position of the mobile station according to received RTT between the serving base station and the mobile station as well as TDOAs between the base stations and the repeaters.

2. (Canceled)

3. (Previously presented) The method for positioning a mobile station according to claim 1, wherein said auxiliary positioning parameter includes: Idle Period DownLink (IPDL) parameter, a scrambling code assigned to the repeater, and carrier frequency and transmission power of the auxiliary positioning signals.

4. (Previously presented) The method for positioning a mobile station according to claim 1, wherein said auxiliary positioning signal is a Primary Common Pilot Channel (P-CPICH) sent only during IPDL and is modulated with a scrambling code synchronized with the base station.

5. (Previously presented) The method for positioning a mobile station according to claim 1, wherein said measurement control message comprises: information of the serving base station and information of an adjacent base station; said information of the serving base station comprising a primary scrambling code of the serving base station; said information of the adjacent base station comprising a primary scrambling code of the adjacent base station, Relative Time Difference (RTD) between the adjacent base station and the serving base station, and a width of a search window.

6. (Previously presented) The method for positioning a mobile station according to claim 5, wherein said measurement control message also comprises information of repeaters inserted in the information of the adjacent base station wherein the information of the adjacent base station further comprises: scrambling codes of the repeaters and RTDs between the serving base station and the repeaters.

7. (Previously presented) The method for positioning a mobile station according to claim 6, wherein said RTDs between the serving base station and the repeaters are determined according to the distances between the repeaters and the serving base station as well as the IPDL parameter, or obtained by measurement using a Location Measurement Unit (LMU).

8. (Original) The method for positioning a mobile station according to claim 5, wherein said scrambling code of a repeater is one of 512 primary scrambling codes and is different from those of adjacent base stations individually.

9. (Currently amended) The method for positioning a mobile station according to claim 6, ~~wherein said processed~~ the method further comprising ~~comprises~~:

(d1) searching in the measurement results of TDOA according to the scrambling codes of the repeaters;

determining whether the mobile station is within the coverage area of repeaters according to the TDOA measurement results;

(d2) correcting the TDOA measurement results and estimating the position of the mobile station if the mobile station is within the coverage area of the repeaters; and

(d3) estimating the position of the mobile station directly with the measurement results if the mobile station is not within the coverage area of the repeaters.

10. (Previously presented) The method for positioning a mobile station according to claim 9, wherein said process d1 further comprises:

(d11) determining, according to the scrambling codes of the repeaters, whether the TDOA measurement results from the mobile station contain a TDOA; if so, executing process d12; otherwise executing process d3;

(d12) determining a time delay and coordinate of the repeater according to the obtained scrambling code of the repeater, and working out the distance between the repeater and the serving base station; and

(d13) determining whether the TDOA corresponding to the repeater is approximately equal to the sum of time delay of the repeater and the time value obtained through dividing the distance between the repeater and the serving base station by the speed of light; if so, executing process d2; otherwise treating the repeater as a pseudo adjacent base station and executing process d3.

11. (Previously presented) The method for positioning a mobile station according to claim 9, wherein said process d2 comprises:

(d21) determining the Time of Arrival (TOA) between the serving base station and the mobile station, the time delays of the repeaters, the distances from the repeaters to the serving base station, the TDOAs between the adjacent base stations and the serving base station, and the TDOAs between the repeaters and the serving base station;

(d22) subtracting the TDOAs between the repeaters and the serving base station from the TDOAs between the adjacent base stations and the serving base station to obtain the TDOA between the adjacent base stations and the repeater; subtracting the time value obtained through dividing the distances between the repeaters to the serving base station by the speed of light from the TOA between the serving base station and the mobile station, and subtracting the time delays of the repeaters from the above-obtained results, to obtain TOAs between the mobile station and the repeaters; and

(d23) determining the position of the mobile station according to the TDOAs between the adjacent base stations and the repeaters as well as the TOAs between the mobile station and the repeaters, in conjunction with the coordinates of the repeaters and the coordinates of the adjacent base stations.

12. (Previously presented) The method for positioning a mobile station according to claim 11, wherein said adjacent base stations include a repeater treated as a pseudo adjacent base station.

13. (Previously presented) A repeater for implementing the function of positioning the mobile station, comprising:

a downlink processing channel and an uplink processing channel, wherein said downlink processing channel includes an added auxiliary positioning unit,

a communication module operable to receive signals carrying auxiliary positioning parameters sent from a mobile communication network;

a frame timing recovery module operable to receive downlink signals from a base station, process the signals to obtain a frame synchronization signal, and send said frame synchronization signal to a timing control module and a pilot modulating module, respectively;

the timing control module operable to receive the frame synchronization signal sent from the frame timing recovery module, and generate and send a pulse sequence to the pilot modulating module, wherein

the pilot modulating module, which receives the frame synchronization signal sent from the frame timing recovery module and the pulse sequence sent from the timing control module, is operable to generate and send auxiliary positioning signals to the mobile station.

14. (Canceled)

15. (Original) The repeater according to claim 13, wherein said downlink processing channel comprises a low noise amplifier, a filter, and a power amplifier.

16. (Previously presented) The repeater according to claim 13, wherein said auxiliary positioning unit also comprises:

a RF processing module operable to output RF signals to an intermediate frequency processing module comprising an automatic gain control sub-module, a RF receiving and filtering sub-module, and a down frequency converter;

an intermediate frequency processing module comprising an intermediate frequency filtering sub-module, an analog-digit converting sub-module, and a digital down frequency converter wherein the intermediate frequency processing module is operable to receive RF signals sent from the RF processing module, process RF signals, generate base-band signals, and send the base-band signals to the frame timing recovery module.

17. (Previously presented) The repeater according to claim 13, wherein said communication module is operable to receive the auxiliary positioning parameters from the base station through signaling.

18. (Previously presented) The repeater according to claim 13, wherein said communication module is operable to receive the auxiliary positioning parameters via the operation and maintenance terminal of the repeater.

19. (Original) The repeater according to claim 13, wherein input signals of said auxiliary positioning unit are directly obtained through coupling with the forwarding antenna.

20. (Original) The repeater according to claim 13, wherein input signals of said auxiliary positioning unit are obtained from a node in the downlink processing channel of the repeater.

21. (Previously presented) The repeater according to claim 13, wherein said auxiliary positioning unit is operable to send output signals after combining with signals from the repeater at a node in the downlink processing channel of the repeater.

22. (Previously presented) The repeater according to claim 13, wherein said auxiliary positioning unit is operable to send output signals via a forwarding antenna after combining with signals from the repeater before the power of the downlink processing channel of the repeater is amplified.